C. REMARKS/ARGUMENTS

1. Status of the Claims

Claims 1 - 33 are currently pending in the application. Claims 1, 24, 27, 28, and 29 are independent. Claims 2- 23 and 33 depend on claim 1. Claims 25-26 depend on claim 24. Claims 30-32 depend on claim 29.

2. Rejection of Claims 1, 19-20, and 24-27 Under 35 U.S.C. § 103

Claims 1, 19-20, and 24-27 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Pat. No. 6,450,664 to Kelly (henceforth "Kelly"), in view of U.S. Pat. No. 4,908,717 to Natori (henceforth "Natori"). The Applicant respectfully traverses these rejections.

Applicant submits that, for the reasons discussed below, a *prima facie* case of obviousness of claims 1, 19-20, and 24-27 has not been established and therefore that there is no proper basis for a 35 U.S.C. § 103 rejection of claims 1, 19-20, and 24-27. See MPEP 2142 ("The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.")

It is well known that, in order to establish a *prima facie* case of obviousness, a rejection must satisfy, *inter alia*, at least the following conditions:

A) The prior art reference(s) must teach or suggest all of the elements and limitations recited in the claims; and

B) There must be some suggestion, teaching, or motivation to combine the references on which the rejection is based.

See MPEP 2142.

Applicant submits that: 1) the combination of Kelly and Natori fails to teach or suggest all of the elements and limitations recited in claims 1, 19-20, and 24-27, and that 2) the record does not establish the requisite suggestion, teaching, or motivation to combine Kelly with Natori.

Claim 1

A.   The Cited Documents (Kelly and Natori), Either Alone or in Combination, Fail to Teach or Suggest All of the Elements Of Claim 1

Applicant's claim 1 is reproduced below:

A reflectometry apparatus, comprising:

a light source adapted to generate light that illuminates at least a portion of a surface of an object, the light source having an elongated configuration and extending from one end to another end;

an actuator configured to move said light source with respect to the object along a trajectory during a time period so that light from said light source sweeps across the surface of the object during the time period;

an optical imaging system configured to receive light reflected from the surface of the object during the time period, and to generate therefrom image data representative of a plurality of N images of the surface of the object during the time period; and

a data processor configured to determine one or more surface reflectance parameters for one or more areas of interest across the surface of the object by processing the image data, the surface reflectance parameters including at least one specular reflectance parameter.

<u>Kelly</u>

Kelly relates to a linear illumination unit having a plurality of LEDs, used e.g. in web applications (<u>see e.g.</u> Kelly Col. 1, lines 5-6, "*The invention relates to linear illumination. Such illumination is required, for example, for "web" applications . . . .* "). Kelly does not relate to, or disclose anywhere, a reflectometry apparatus. Also, nowhere in Kelly are any surface reflectance parameters, or the determination of any surface reflectance parameters by a reflectometry apparatus, disclosed.

Kelly does not teach or suggest at least the following elements of claim 1:

(1)   an actuator configured to move said light source with respect to the object along a trajectory during a time period so that light from said light source sweeps across the surface of the object during the time period;

(2)   an optical imaging system configured to receive light reflected from the surface of the object during the time period, and to generate therefrom image data representative of a plurality of N images of the surface of the object during the time period; and

(3)   a data processor configured to determine one or more surface reflectance parameters for one or more areas of interest across the surface of the object by processing the image data, the surface reflectance parameters including at least one specular reflectance parameter.

Regarding element (1) above, the Examiner has acknowledged that Kelly does not teach element (1). See Office Action, page 2, fourth sentence from the bottom ("*Kelly differs from the claimed invention in that an actuator is not specifically provided . . .*")

Also, Kelly does not teach element (2) above. In fact, Col. 1, lines 21-25 in Kelly, which were cited by the Examiner to support his position that Kelly discloses element (2), refers to the prior art for the Kelly document, rather than to the actual disclosure. (The cited Col. 1, lines 21-25 of Kelly describes "a typical machine system," under the caption "PRIOR ART DISCUSSION," appearing on the immediately preceding line 20 of Col. 1.) Contrary to the Examiner's statement, Col. 1, lines 21-25 of Kelly, as well as Col. 1, line 5 of Kelly (which refers to a "*linescan camera*" used in a web application) do not disclose any optical imaging system that is included in a reflectometry apparatus, nor do they disclose any optical imaging system that is configured to receive light reflected from a surface of an object during a time period in which light source is moved with respect to the object, and that is configured to generate from the reflected light, during the time period, image data representative of a plurality of N images of the surface of the object.

Kelly also does not teach element (3) above. Surface reflectance parameters, described for example in Applicant's specification paragraphs [0024] and [0025] (portions of which are reproduced below), are not even mentioned or addressed in Kelly, much less any data processor configured to determine any surface reflectance parameters (including at least one specular reflectance parameter) across a surface of

an object by processing image data from an optical imaging system. Applicant's specification paragraphs [0024] and [0025] state, *inter alia*, as follows:

". . . reflectance is defined as the ratio of the energy of reflected light to the energy of the incident light . . . surface reflectance can be described in terms of two components, namely diffuse reflectance and specular reflectance . . . Diffuse reflectance is characterized by a single parameter . . . namely the diffuse reflectance parameter ρ_d that is representative of the proportion of incident light that undergoes diffuse reflection. On the other hand, there are two parameters per color channel associated with specular reflection, namely the specular reflectance parameter ρ_s and the specular roughness parameter a . . .".

The Examiner quoted Col. 6, lines 11-18 of Kelly, and stated as follows:
". . . *Kelly discloses linear illumination unit . . . comprising . . . an optical imaging system . . . to receive reflected light and to generate image data . . . including spectral reflectance data (Col. 6, lines 11-18)."* Office Action page 2.

Applicant notes that "spectral reflectance data" are not recited anywhere in Applicant's claim 1. Rather, Applicant's claim 1 recites surface reflectance parameters, and further recites at least one specular reflectance parameter. As noted above, surface reflectance parameters as well as the specular reflectance parameter are clearly described in Applicant's specification, e.g. in paragraphs [0024] and [0025]. As noted above, neither surface reflectance parameters nor a specular reflectance parameter are taught, suggested, or mentioned in Kelly.

Further, Col. 6, lines 11-18 of Kelly are reproduced below:
[. . . *an array of LEDs 70 is illustrated. Each LED 70 comprises a central emitting aperture . . .*] *This embodiment has particular advantages also for inspection of specular objects in which the appearance of the source, as viewed in the specular surface of the object, should be as continuous as possible.*]

As seen from the quotation above, Col. 6 lines 11-18 of Kelly does not disclose any optical imaging system that receives light reflected from a surface of an object (during a time period in which the light source is moved with respect to the object) to generate image data representative of a plurality of N images of the surface of the object during the time period. Rather, col. 6 lines 11-18 discusses an array of LEDs each having an elongated aperture, and merely states that this array of LEDs can be useful when specular objects are inspected. This is simply unrelated to element (3) of claim 1.

Natori

Natori relates to an image scanner, not to a reflectometry apparatus. Natori does not address or mention any determination of any surface reflectance parameters of an object.

Applicant submits that Natori does not teach or suggest at least elements (2) and (3) (listed below) of claim 1. Further, the Examiner does not state anywhere that Natori discloses any of the elements (2) and (3) (listed below) of claim 1:

(2)   an optical imaging system configured to receive light reflected from the surface of the object during the time period, and to generate therefrom image data representative of a plurality of N images of the surface of the object during the time period; and

(3)   a data processor configured to determine one or more surface reflectance parameters for one or more areas of interest across the surface of the object by processing the image data, the surface reflectance parameters including at least one specular reflectance parameter.

Because Kelly does not teach or suggest at least elements (1), (2), and (3) of claim 1, and because Natori does not teach or suggest at least elements (2) and (3) of claim 1, the combination of Kelly and Natori does not teach or suggest all the elements of claim 1. Therefore, the proposed combination of Kelly and Natori is not a proper basis for an obviousness of rejection of claim 1.

B.   There is no Suggestion, Teaching, or Motivation to Combine the Documents (Kelly and Natori) on which the Examiner's Rejection is Based

Applicant submits that, not only does the proposed combination of Kelly and Natori fail to teach or suggest all the limitations of claim 1, but also there is no suggestion within the cited documents (Kelly and Natori) of any desirability of making such a combination, nor is there any teaching motivation for such a combination.

It is well established that the Examiner must provide some suggestion of the desirability of doing what the inventor has done, without the benefits of impermissible hindsight. See MPEP 2142 and In Re San Su Lee, 277 F.3d at 1338: *"The initial burden is on the Examiner to provide some suggestion of the desirability of doing what the inventor has done."* The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). See MPEP 2143.01. It is also well established that, in order for a *prima facie* case of obviousness to be established, the teaching or suggestion to make the claimed combination must be found in the prior art itself, and not based on applicant's disclosure. In Re San Su Lee, 277 F.3d 1338 (CAFC 2002) ("[T]*he evidence of record must identify an objective source of the motivation to combine A with B in the manner proposed."*) See also MPEP §§2141-2142.

Applicant submits that nothing in Kelly and/or Natori suggests the desirability of combine Kelly with Natori in the manner proposed, nor is any motivation for the proposed combination found in Kelly and/or Natori. Applicant further submits that, even if the documents (Kelly and Natori) were so combined, the proposed combination would not teach or suggest all the elements of claim 1, as explained above.

For all the reasons discussed above, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness, and that there is no proper basis for the 35 U.S.C. § 103 rejection of independent claim 1. Applicant respectfully submits that independent claim 1 is allowable.

Claim 24

Applicant submits that the cited documents (Kelly and Natori), either alone or in combination fail to teach or suggest all the limitations of claim 24. Therefore the combination of Kelly and Natori is not a proper basis for an obviousness rejection of claim 24.

For reasons discussed in connection with claim 1 above, Applicant submits that Kelly and Natori, either alone or in combination, fails to teach or suggest at least elements (1) and (2) (listed below) of claim 24.

(1)   an optical imaging system configured to receive light reflected from the surface of the object during the time period, and to generate therefrom image data representative of a plurality of N images of the surface of the object during the time period;

(2)   a data processor configured to process the image data so as to determine one or more surface reflectance parameters for one or more areas of interest across the surface of the object, the surface reflectance parameters including at least one specular reflectance parameter.

Further, as discussed above in connection with claim 1, Applicant submits that, no suggestion of the desirability of combining Kelly and Natori can be found, nor can any motivation to combine Kelly and Natori in the proposed manner be found.

For all the reasons discussed above, Applicant submits that the Examiner has failed to establish a *prima facie* case of obviousness, and that there is no proper basis for the 35 U.S.C. § 103 rejection of independent claim 24, which is not rendered obvious by Kelly and Natori, either alone or in combination. Applicant respectfully submits that independent claim 24 is allowable.

Claim 27

Applicant submits that the cited documents (Kelly and Natori), either alone or in combination, fail to teach or suggest at least the limitations (1) and (2), listed below, of claim 27:

1)   an optical imaging system configured to receive light reflected from the surface of the object during the time period, and to generate from the received light image data representative of a plurality of N images of the surface of the object during the time period;

2)   wherein the image data are adapted to be processed by a data processor that is configured to determine one or more surface reflectance parameters for one or more areas of interest within the surface of the object using the image data, the surface reflectance parameters including at least one specular reflectance parameter.

Because the proposed combination of Kelly and Natori does not teach or suggest all the elements of claim 27, the proposed combination is not a proper basis for an obviousness rejection of claim 27. Applicant further submits that there is no suggestion of any desirability of making such a combination, nor is there any teaching or motivation for such a combination.

Applicant respectfully submits that no *prima facie* case of obviousness has been established, and that independent claim 27 is not rendered obvious by Kelly and Natori, either alone or in combination, and is allowable.

Claims 19-20 and 25-26

It is well known that "[i]f an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious." MPEP 2143.03; In re Fine, 837 F.2d 1071, 2 USPQ2s 1596 (Fed. Cir. 1988).

Claims 19-20 depend on claim 1, and therefore include all the limitations of claim 1. For all the reasons discussed in section 2 above, claim 1 is nonobvious under 35 U.S.C. § 103 over Kelly in view of Natori. Accordingly, it follows that claims 19-20 (all depending from claim 1) are also nonobvious under 35 U.S.C. §103.

For these reasons, Applicant respectfully submits that claims 19-20 and 25-26 are allowable.

3. Allowable Subject Matter

Applicant notes with appreciation that claims 28-33 have been allowed.

Applicant further notes with appreciation that claims 2-12, 14-18, and 21-23 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Applicant has not rewritten claims 2-12, 14-18, and 21-23 in independent form, in the belief that claim 1, upon which claims 2-12, 14-18. and 21-23 depend, is allowable, for all the reasons discussed above.

4. Conclusion

On the basis of the foregoing amendments, Applicant respectfully submits that all of the pending claims are in condition for allowance. An early and favorable action is therefore earnestly solicited.

Respectfully submitted,

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